

Patent Claims

1. A fuel cell module (7) having a large number of permeable anode and cathode plates (1, 2) which are stacked one on top of the other, having electrolyte material (3) between adjacent anode and cathode plates (1, 2), and having connections to the anode and cathode plates (1, 2) for supplying and carrying away gas (G) and fuel (B), with the anode plates (1) being connected electrically in parallel and the cathode plates (2) being connected electrically in parallel, characterized in that the anode plates (1) and cathode plates (2) each have parallel tubes (5) which extend in the longitudinal direction for gas (G) or fuel (B) to pass through, the longitudinal axes of the anode plates (1) are aligned offset at an angle to the longitudinal axes of the cathode plates (2), and metallic connecting stubs (9) are arranged on the end faces of the anode plates (1) and cathode plates (2) and each communicate with the parallel tubes (5) for supplying (IN) or carrying away (OUT) gas (G) or fuel, with those anode plates (1) or cathode plates (2) which are in each case located on a common end face being connected electrically in parallel to the connecting stubs (9), and being connected to a common supply line or outlet line (10).

2. The fuel cell module (7) as claimed in claim 1, **characterized in that** the anode and cathode plates (1, 2) have a rectangular base area with longitudinal faces which are longer than the end faces, with the anode plates (1) being aligned parallel to one another and the cathode plates (2) being aligned parallel to one another, and with the longitudinal axes of the anode plates (1) being aligned offset at an angle to the longitudinal axes of the cathode plates (2).

3. The fuel cell module (7) as claimed in claim 2, **characterized in that** the anode and cathode plates (1,

2) are arranged centered in a cruciform shape, with the longitudinal axes of the anode plates (1) being aligned at right angles to the longitudinal axes of the cathode plates (2).

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4. The fuel cell module (7) as claimed in one of the preceding claims, **characterized in that** electrically conductive filling material (8) is introduced at the end faces into the spaces between those connecting ends
10 of the anode or cathode plates (1, 2) which are located one on top of the other, and completely fills the spaces.

5. The fuel cell module (7) as claimed in claim 4,
15 **characterized in that** the common supply line or outlet line (10) has a connecting stub (9) which extends over the height of the fuel cell module (7) and over the width of the associated end face.

20 6. The fuel cell module (7) as claimed in one of the preceding claims, **characterized in that** the anode plates (1) and the cathode plates (2) have an electrically insulating, ion-conducting electrolyte layer (3) on the surfaces of the rectangular base area.

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7. The fuel cell module (7) as claimed in claim 6, **characterized in that** the electrolyte layer (3) has 8YSR or ScSZ.

30 8. The fuel cell module (7) as claimed in one of the preceding claims, **characterized in that** an electrically insulating, ion-conducting intermediate layer (4) is in each case arranged between anode plates (1) and cathode plates (2) which are arranged one on top of the other.

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9. The fuel cell module (7) as claimed in claim 8, **characterized in that** the intermediate layer (4) has nickel-8YSR or CeO_x/Ni.

10. The fuel cell module (7) as claimed in one of the preceding claims, **characterized in that** the anode plates (1) have nickel cermet.
- 5 11. The fuel cell module as claimed in one of the preceding claims, **characterized in that** the cathode plates have perovskite ($\text{La}_x\text{Sr}_y\text{Ca}_z\text{MnO}_3$).
- 10 12. The fuel cell module (7) as claimed in one of the preceding claims, having a power electronics circuit with a current/voltage converter for increasing the voltage.
- 15 13. A fuel cell battery having at least two fuel cell modules (7) as claimed in one of the preceding claims, **characterized in that** the fuel cell modules (7) are electrically connected in series.
- 20 14. The fuel cell battery as claimed in claim 13, **characterized in that** the fuel cell modules (7) are stacked one on top of the other.